12.0 ANALYTICAL SCHEMES AND GUIDELINES

12.1 Application

12.1.1 Analytical schemes allow the analyst to determine an appropriate course of action for diverse exhibits that potentially contain legally significant substances. The schemes outlined in this chapter give only general guidance for sampling and analysis of various exhibit types.

12.1.2 The analyst may choose to utilize different methods and sampling schemes to maximize efficiency providing there is no detriment to the quality of analysis and/or unapproved deviation from policy.

12.1.3 In the event that a submission does not conform to any of these schemes, the analyst should consult their supervisor or Technical Leader on how to proceed.

12.1.4 The unit supervisor and/or Technical leader will reserve the right to require further analysis if they consider it is necessary.

12.1.5 Analytical schemes for cannabis plant materials are discussed in the Cannabis Identification and THC Quantitation Chapters

12.2 Categorizing Analytical Techniques and Identification Criteria

12.2.1 Techniques for the analysis of drug samples are classified into three categories based on their maximum potential discriminating power (see the table below). However, the classification of a technique may be lower if the sample matrix or mode of operation diminishes its discriminating power.

Categories of Analytical Techniques

Category A (confirmatory)	Category B (supporting)	Category C (screening)
FTIR	Gas Chromatography	Color Test
GC/FTIR	HPLC	Ultraviolet Spectroscopy
GC/MS	Thin Layer Chromatography	
	Pharmaceutical Identifiers	
	Marijuana only: Macroscopic Examination Microscopic Examination	

12.2.2 Category A tests provide structural information for analytes of interest and are required for **all** identifications with the exception of marijuana identification and marked pharmaceutical preparations. Refer to the Marijuana chapter for suitable analytical techniques and their identification criteria. Marked pharmaceuticals are discussed in section 12.5.

12.2.3 The analyst must use at least one other technique **suitable for the analyte of interest** from either Category A, B, or C for valid identification of legally significant substances.

The analyst may choose to perform more than the minimum required tests at their discretion.

12.3 Consistency of Analytical Results

12.3.1 Separate samples of the unit to be examined must be collected for each type of analytical technique to ensure consistent results are obtained during analysis.

12.3.2 Some exhibits may not allow for separate samplings due to the nature of the analytes and/or their concentrations without complete consumption of the unit. The following term has been defined for use with this scenario.

12.3.2.1 *Insufficient for Identification* – exhibits that the analyst may consider an adequate amount of material to begin analysis, however do not have enough for a second, independent technique due to complexity of the analyte and/or matrix.

- Example 1: The analyst receives a small amount of brown powder that weighs 0.06 g. The analyst takes two samples - one for a Marquis color test that gives a dark brown color, and the other for a GC/MS spectra that indicates a mixture of heroin and weak fentanyl. Consumption of the entire exhibit would be necessary to successfully identify these compounds. At this point, the exhibit would be deemed as Insufficient for Identification and reported as such.

12.3.2.2 Exhibits that meet these criteria and are part of a death or other violent crime investigation are further discussed in the Death Investigations Chapter. Refer to that chapter for analytical guidelines.

12.3.3 The unit supervisor and/or Technical Leader will be consulted on how to proceed with any exhibits that produce inconsistent results during analysis.

12.4 Supplemental Criteria for Analysis

12.4.1 Spectra obtained from instrumentation will be compared to primary standard data obtained within the TBI laboratory system for making final identifications.

12.4.2 Tests must be considered “positive” for the results to be considered valid for identification. While “negative” results provide useful information for ruling out the presence of a particular drug or drug class, these results have no value toward establishing the forensic identification of a substance.

12.4.3 In cases where hyphenated techniques are used, they will be considered as separate techniques provided that the results from each are used. However, separate samples from the unit must be used for each instrumental technique (see section 12.3.1).

12.4.4 Some legally significant compounds may have multiple isomers. Isomeric form should be determined if possible. In the event the isomeric form cannot be determined with current laboratory instrumentation, the report will include the remark *Isomeric form not determined*.

12.4.5 Exhibits that demonstrate insufficient instrument response for conclusive identification even after samples are concentrated or new samples of the exhibit have been analyzed may be classified as *Inconclusive* or *No controlled substances identified.*

12.5 Marked Pharmaceutical Preparations

12.5.1 Pharmaceutical preparations, regardless of schedule, will only be visually identified using acceptable pharmaceutical identifiers outlined in the Pharmaceutical Identifiers chapter. Weight threshold and/or hypergeometric sampling will only occur if approved by laboratory management.

12.5.2 Broken tablets that demonstrate complete product identifications upon examination can be treated as whole tablets.

12.5.3 Non-legally significant pharmaceuticals may be noted as *Exhibit visually identified as a non-controlled substance* if they give no indication that they may be counterfeit, and the case is **not** part of a death investigation, other violent crime against a person, a multi-section case with toxicology, or an introduction into a penal facility charge. Reporting requirements for the last two scenarios are found in the Reporting chapter.

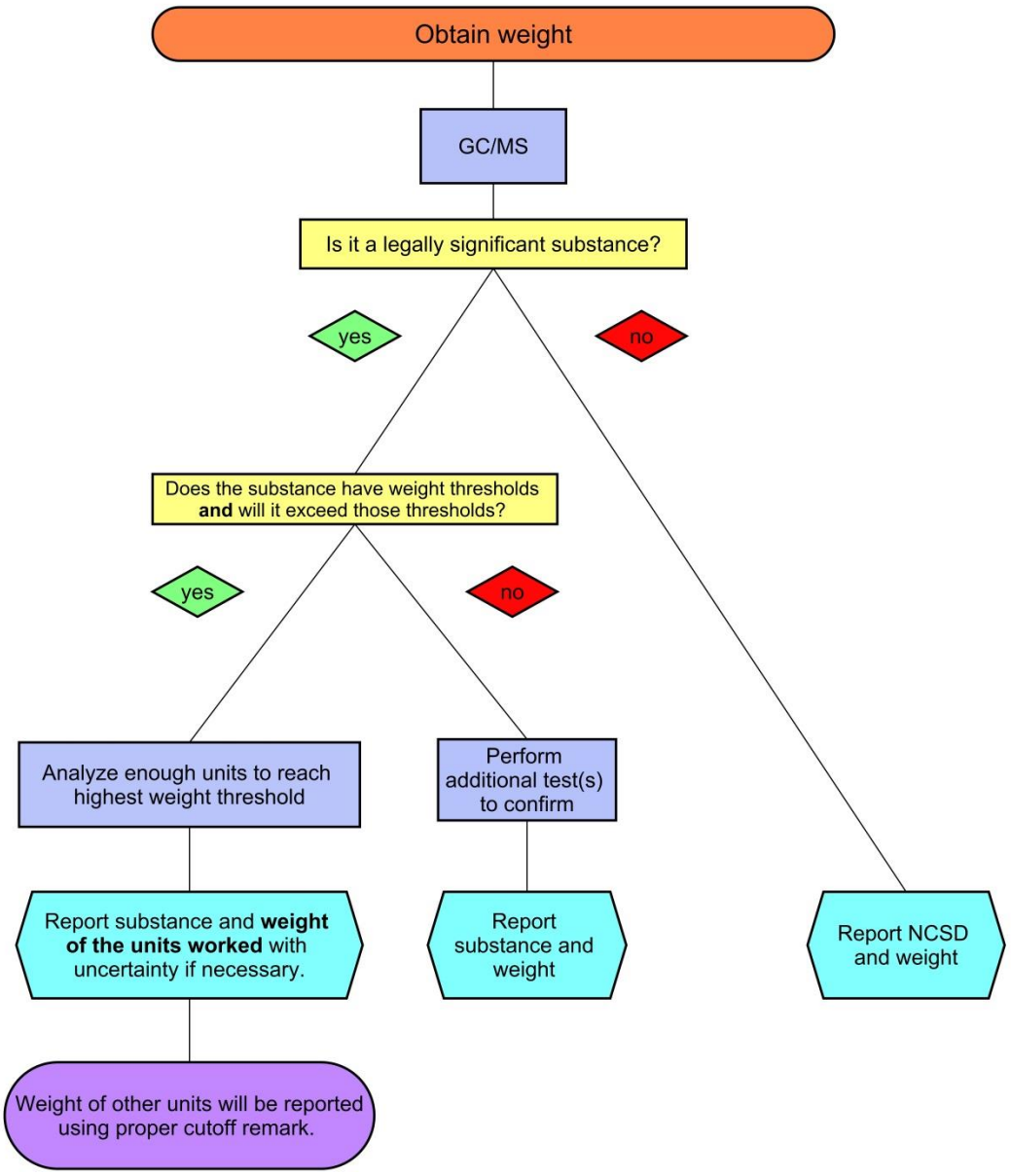
12.5.4 Full analysis will be performed on one unit for pharmaceutical tablet fragments if they are the only exhibit in the case.

12.5.5 It may also be necessary to contact the customer if the analyst suspects a submission may contain counterfeit pharmaceuticals, but there are no indications of suspected counterfeits on the submittal form.

12.6 Analytical Scheme Flow Charts

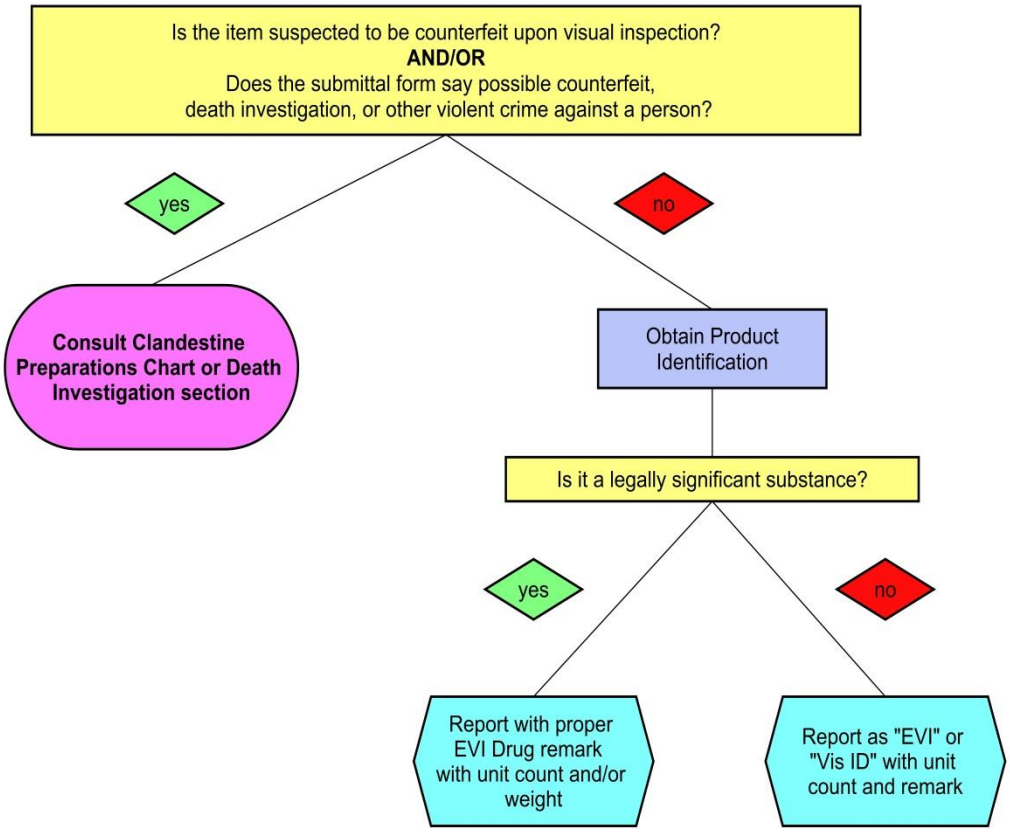
12.6.1

Plant Material not Consistent with Marijuana (including mushrooms)



12.6.2.1

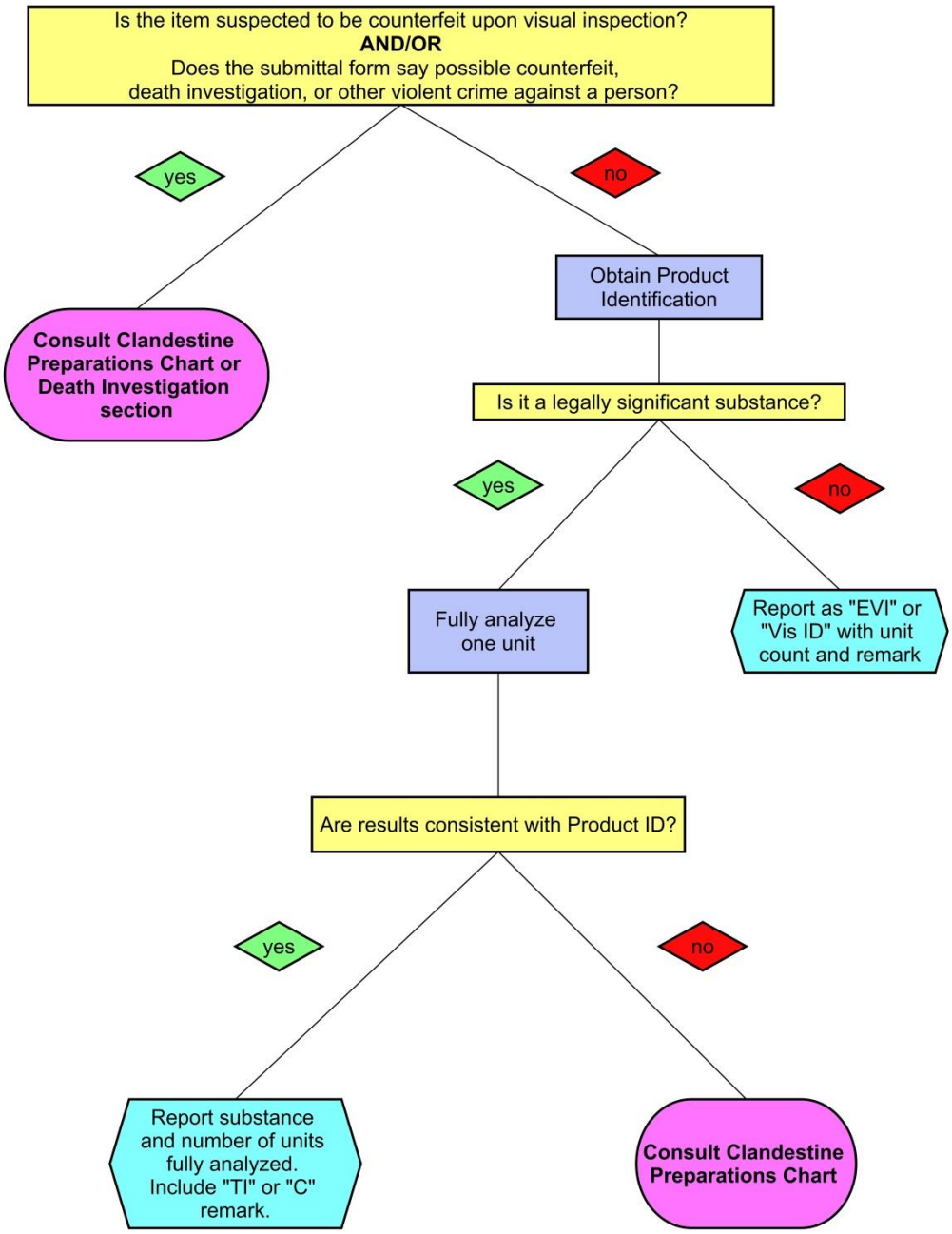
Pharmaceutical Preparations with Markings/Imprints



12.6.2.2

Pharmaceutical Preparations with Markings/Imprints (No Weight Thresholds)

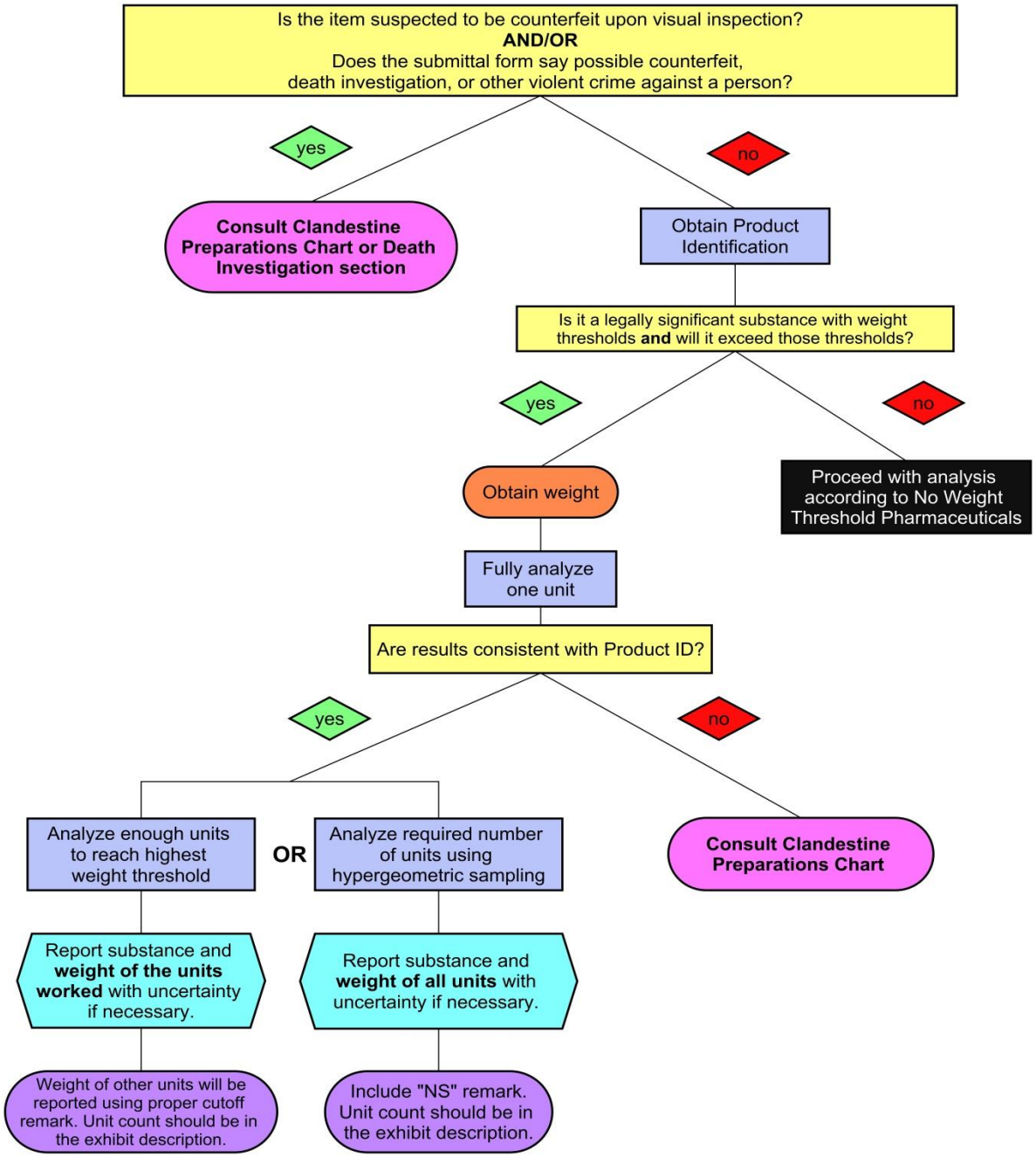
* Additional analysis requested and approved *



12.6.2.3

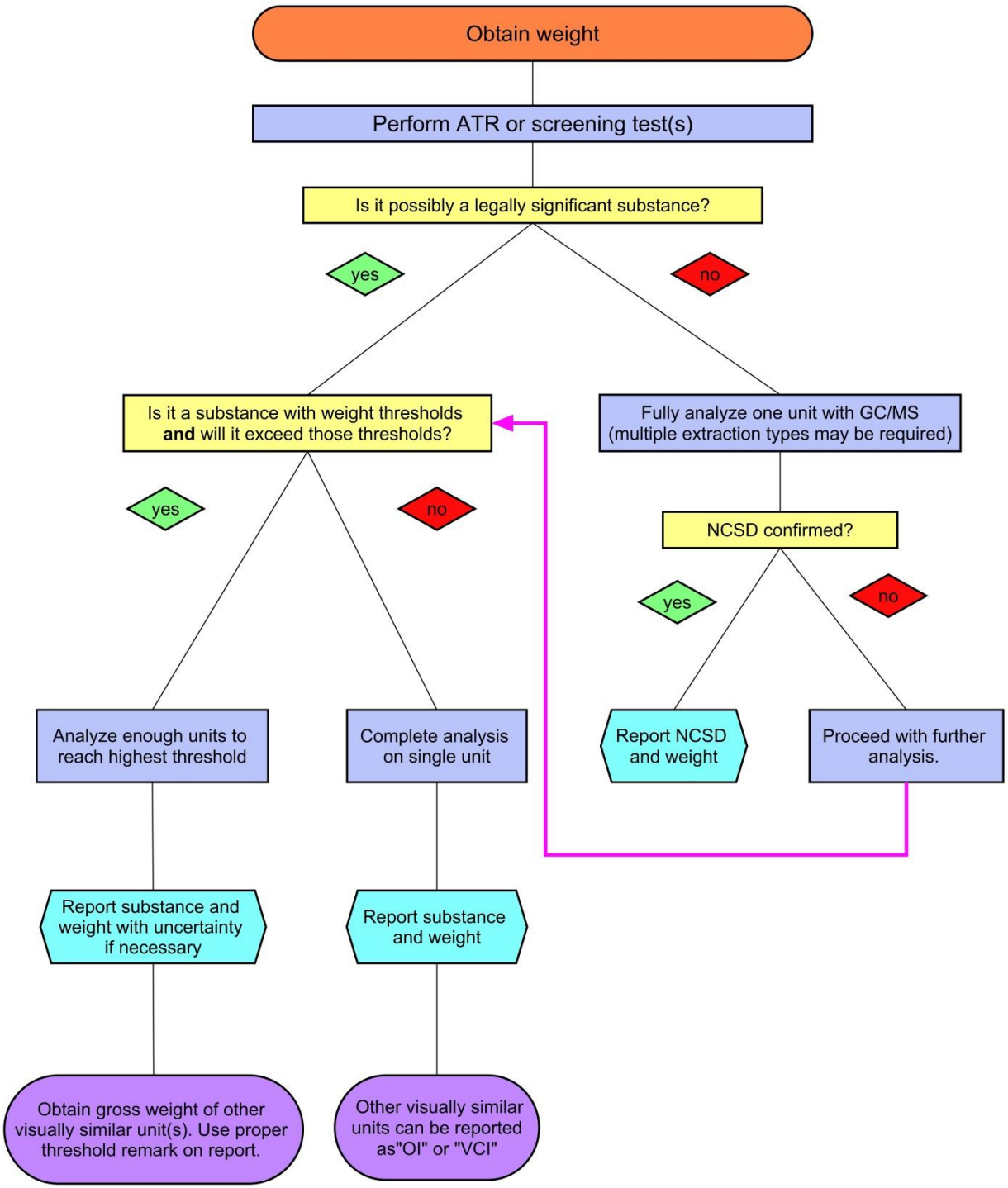
Pharmaceutical Preparations with Markings/Imprints (Weight Thresholds)

* Additional analysis requested and approved *



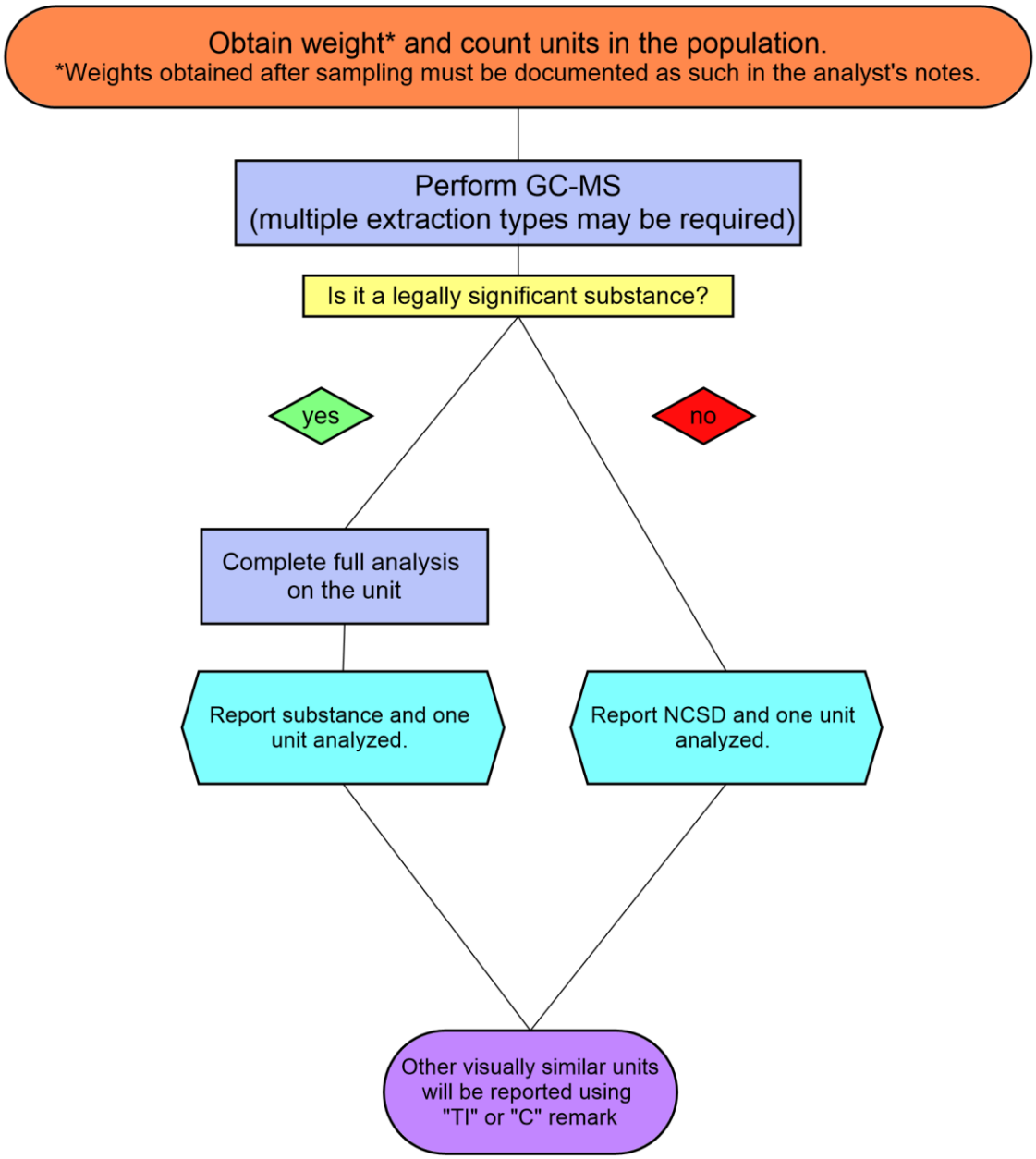
12.6.3

Powders, Rock-like Substances, and Crystalline Substances



12.6.4.1

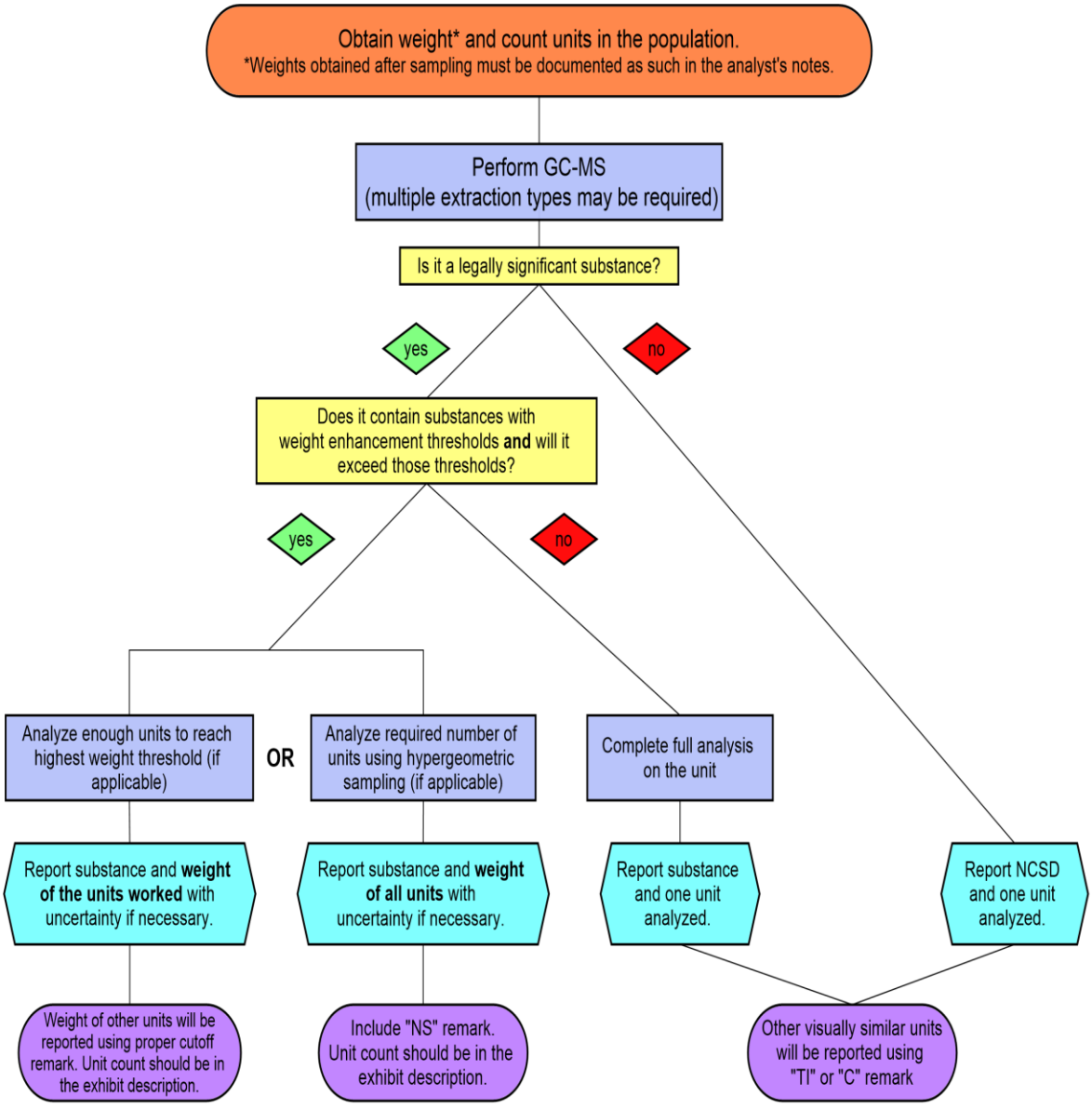
Clandestine, Counterfeit, and Other Unmarked Preparations



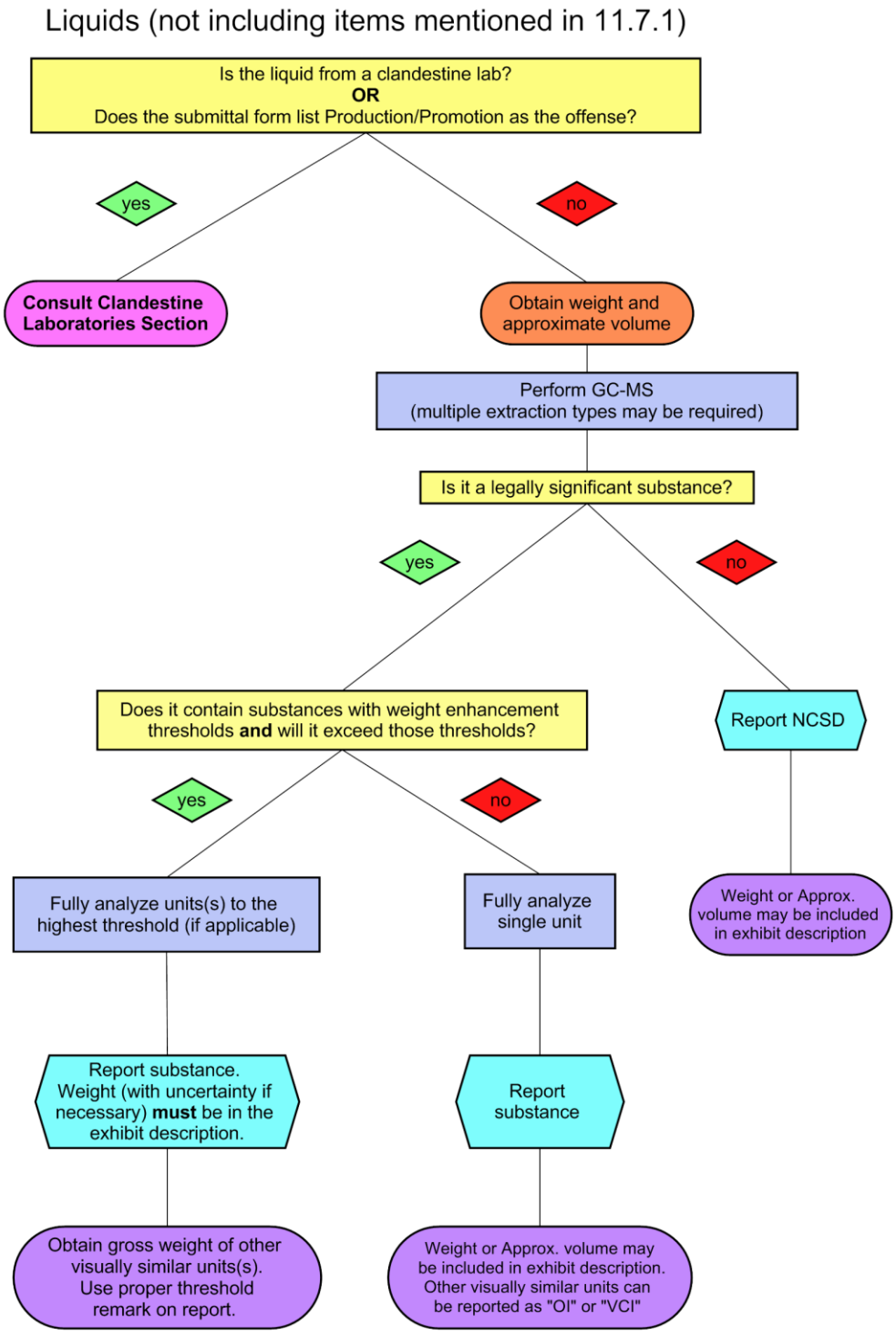
12.6.4.2

Clandestine, Counterfeit, and Other Unmarked Preparations

*Additional analysis requests and approved

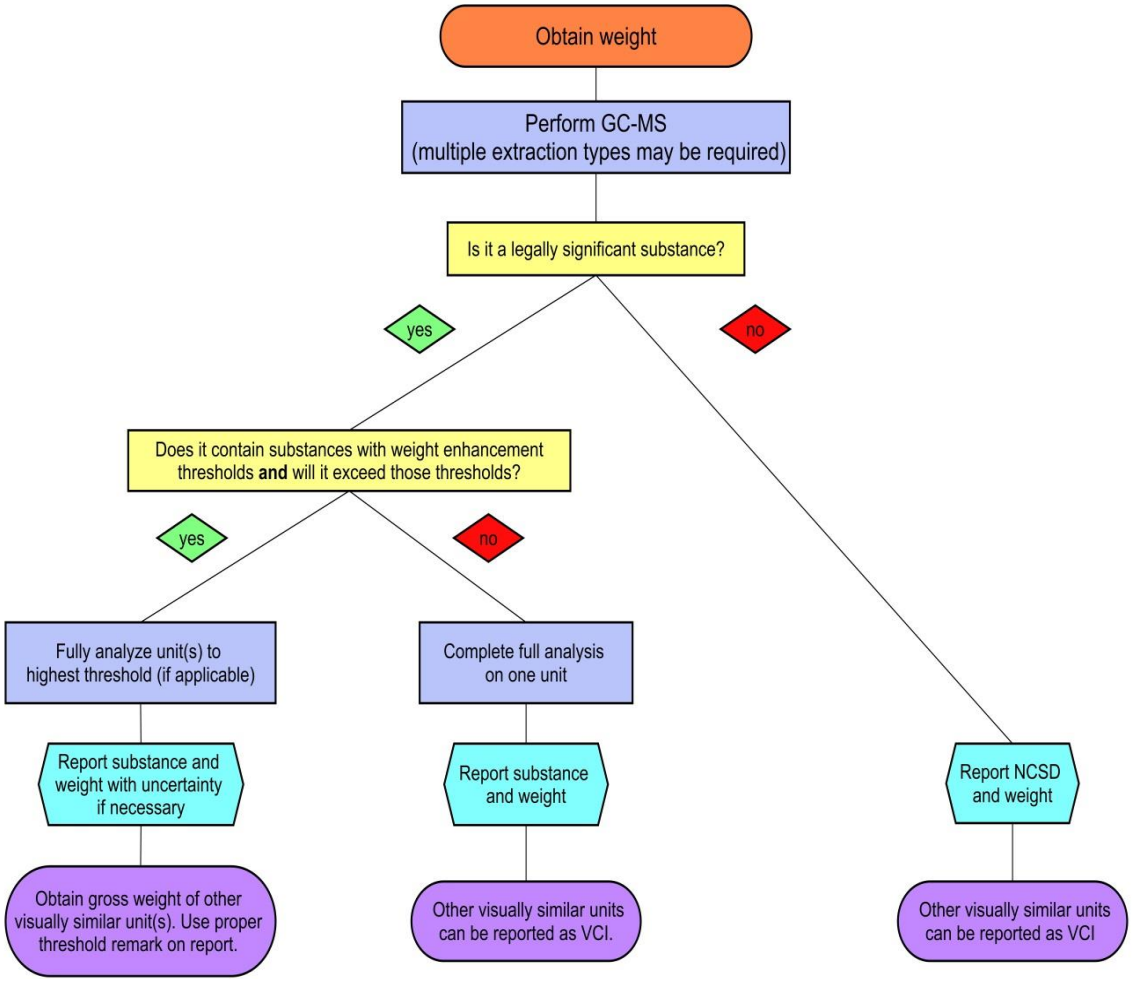


12.6.5


Liquids (not including items mentioned in 11.7.1)
Is the liquid from a clandestine lab?
OR
Does the submittal form list Production/Promotion as the offense?
yes
no
Consult Clandestine Laboratories Section
Obtain weight and approximate volume
Perform GC-MS
(multiple extraction types may be required)
Is it a legally significant substance?
yes
no
Does it contain substances with weight enhancement thresholds and will it exceed those thresholds?
Report NCSD
yes
no
Fully analyze units(s) to the highest threshold (if applicable)
Fully analyze single unit
Weight or Approx. volume may be included in exhibit description
Report substance. Weight (with uncertainty if necessary) must be in the exhibit description.
Report substance
Obtain gross weight of other visually similar units(s). Use proper threshold remark on report.
Weight or Approx. volume may be included in exhibit description. Other visually similar units can be reported as "OI" or "VCI"

12.6.6

Paper Exhibits and Other Ingestible Items (cookies, candies, etc...)



12.6.7

Liquid Units Outlined in 11.7.1 (vials, vape cartridges, etc...)